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DIRECTORATE OF  
INTELLIGENCE

# Intelligence Report

*China: Overland Transportation Routes  
to North Vietnam*

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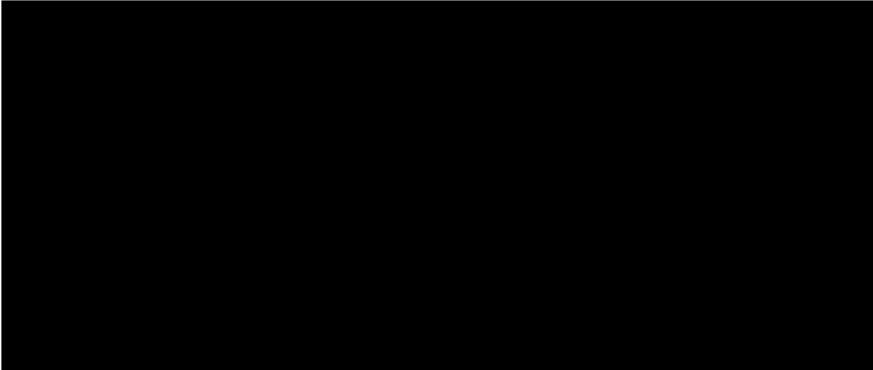
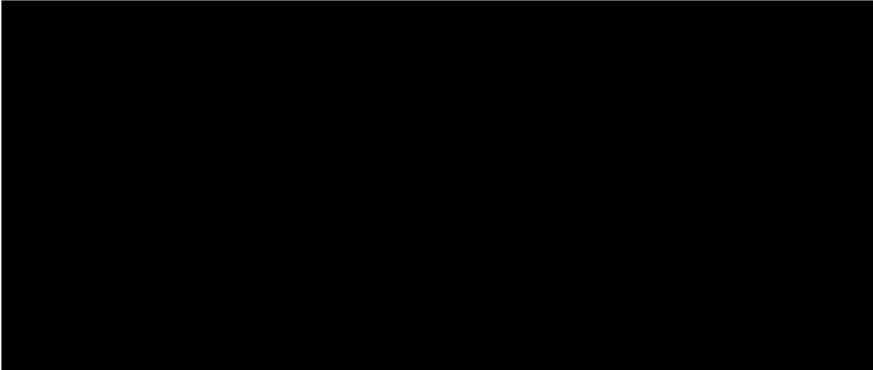
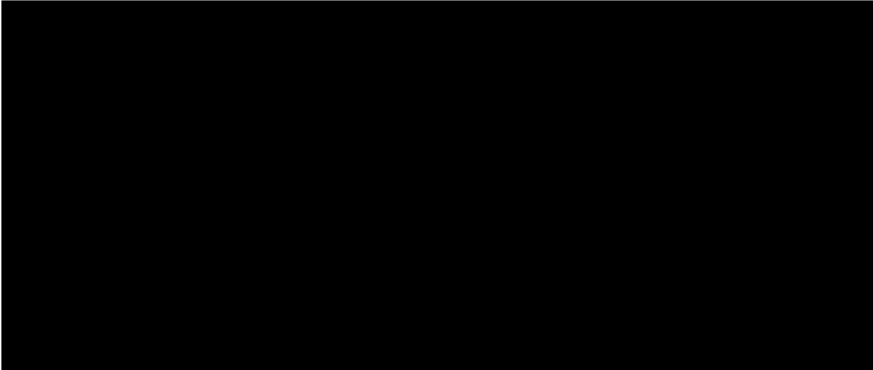
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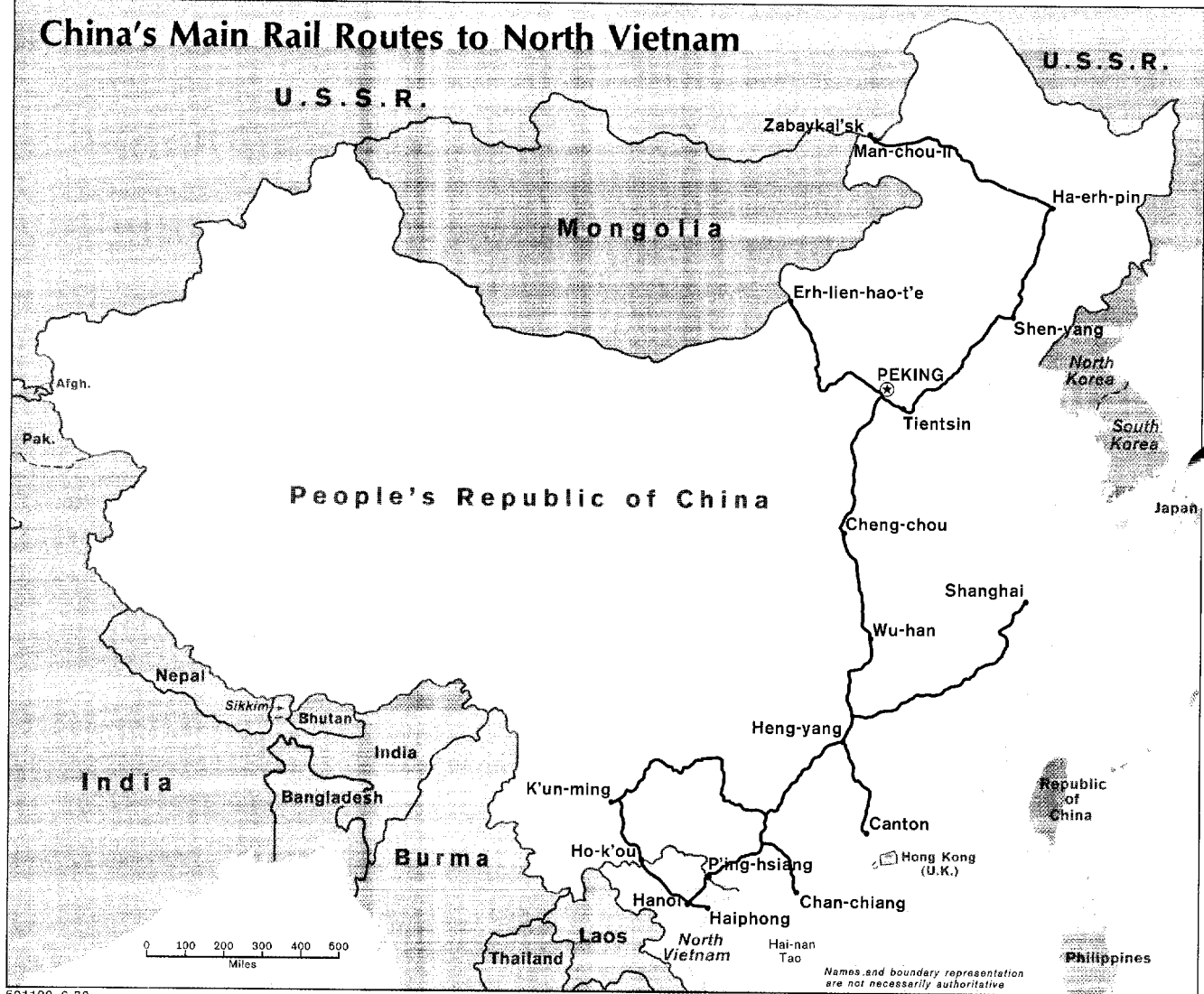
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Figure 1



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CENTRAL INTELLIGENCE AGENCY

Directorate of Intelligence

July 1972

INTELLIGENCE REPORT

CHINA: OVERLAND TRANSPORTATION ROUTES  
TO NORTH VIETNAM

Summary and Conclusions

1. If the volume of goods that came in by sea to North Vietnam before May 1972 were shipped overland across the People's Republic of China (PRC), the Chinese transportation system could handle the additional tonnage with only small disruption of domestic traffic.

2. The most important route involved -- assuming the USSR continued to be North Vietnam's principal supplier of these goods -- would be the direct rail route from the USSR across China to Hanoi. Traffic using this route would enter China at the rail transloading point of Man-chou-li - Zabaykal'sk. The traffic would then move over the main Chinese north-south rail line through Ha-erh-pin (Harbin), Peking, Cheng-chou, and Wu-han, eventually reaching the North Vietnamese border at P'ing-hsiang or possibly Ho-k'ou. An alternative route would be across Mongolia to the Erh-lien-hao-t'e transloading point, then over to Peking, and south as on the first route.

3. Chinese ports and related rail lines might also be used to move supplies to the border of North Vietnam. Re-routed ships would probably use the southern Chinese ports of Chan-chiang and Canton. Additional rail-served ports farther north, such as Shanghai, would also be available if needed. The advantages of each port in terms of unloading and storage facilities and distance to P'ing-hsiang would ultimately determine its share of the diverted traffic. Other available means of transportation include numerous roads crossing the border into North Vietnam and one major inland waterway, the Red River. These roads could provide alternative routes for the rail lines leading into North Vietnam.

Note: This report was prepared by the Office of Economic Research and coordinated within the Directorate of Intelligence.

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4. Within North Vietnam, the capacity of the rail and road networks, if uninterdicted, would be sufficient to handle the additional imports coming overland from China. The dynamics of the US bombing program and North Vietnamese countermeasures make it impossible to judge, before the fact, what volume of traffic could actually be transported within North Vietnam at any given time.

### Introduction

5. This report investigates the capability of the Chinese railroad transloading or transshipment points,<sup>(1)</sup> railroad lines and rolling stock, ports, and roads to carry traffic diverted from Haiphong and other North Vietnamese ports closed as a result of the US air and sea interdiction effort. During 1971 a daily average of approximately 6,000 metric tons of goods -- equivalent to about 170 loaded freight cars and 25 loaded tank cars -- were imported into North Vietnam by sea principally through the port of Haiphong. These goods previously brought in by sea now have to be diverted in whole or in part to the overland rail route through China from the USSR or to ports in eastern and southeastern China for shipping by railroad to the North Vietnamese border at P'ing-hsiang. In addition to surveying the actual physical consequences of this diversion, the report also discusses the historical record of traffic moving through the border crossing points from the USSR to North Vietnam and concludes with a description of the capability of the North Vietnamese transportation system to handle traffic crossing the border from China.

### Discussion

#### Capacity of the Chinese Overland Transportation Network

##### Rail Transloading or Transshipment Points

6. If all the cargo formerly entering Haiphong by sea were diverted to the overland rail route from the USSR, the two most likely points of entry into China would be at Man-chou-li - Zabaykal'sk on the USSR border or Erh-lien-hao-t'e on the Mongolian border (see Figure 1). In addition,

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1. **Transloading** consists of the transfer of freight or passengers between units of the same mode of transportation. The term is most commonly used in connection with a change of rail gauge but is also applicable in other circumstances. **Transshipment** consists of the transfer of freight or passengers between units of different modes of transport, such as between railroad cars and ships or trucks.

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the rail border crossing at Sui-fen-ho - Pogranichnyy on the USSR border (about 150 miles from the Soviet port of Vladivostok), which up to now has not been used as a transloading point for North Vietnam traffic, could be used to handle shipments from the Soviet Far East.<sup>(2)</sup> Traffic leaving China would enter North Vietnam at either the P'ing-hsiang - Dong Dang or Ho-k'ou - Liu-tiao-pan - Lao Cai complexes, the major point of entry being at P'ing-hsiang. The following paragraphs discuss briefly each transloading or transshipment point and describe facilities and capacity to handle cross border rail traffic.<sup>(3)</sup>

*Man-chou-li*

7. The Man-chou-li railroad transloading yard is approximately 3 miles from the Sino-Soviet border in northeast China. This facility consists of two yards containing Soviet broad gauge (5 foot) track; two yards containing Chinese standard gauge (4 feet 8-1/2 inches) track; a petroleum transloading facility; several transshipment areas; warehouses; a passenger station; and repair facilities for both locomotives and cars. The transloading yard functions as a transfer point from Soviet broad gauge to Chinese standard gauge tracks and as a gauge-changing facility for Soviet broad gauge and Chinese standard gauge passenger cars. The yard contains standard, broad, and dual-gauge tracks.

8. The Man-chou-li transloading yard has an estimated operating capacity of approximately 3,000 rail cars and normally accommodates fewer than 500 cars. Both Chinese standard gauge and Soviet broad gauge cars are found in the yard. Freight traffic moving between the Soviet Union and China through this rail facility must be transloaded from broad gauge rail cars to standard gauge rail cars. Petroleum moving across the border

2. See the map of major transportation routes in China, Figure 6, the detailed map of transportation routes at the Chinese - North Vietnamese border and within North Vietnam, Figure 7, and the overall map of the Chinese railroad system, inside back cover.

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is mainly transloaded at Man-chou-li, rather than Zabaykal'sk on the Soviet side. The Man-chou-li petroleum products storage facility is just west of the engine and car repair maintenance area.

*Zabaykal'sk*

9. The Zabaykal'sk railroad transloading yard is in the USSR, approximately 8 miles north of the Man-chou-li transloading yard. This facility includes receiving and classification yards; transloading yards; holding yards; a petroleum storage and transloading facility; an engine repair and maintenance facility; storage areas; a coaling station; a turning wye; and a passenger station. The transloading station functions as a transfer point from Soviet broad gauge to Chinese standard gauge tracks and as a gauge-changing facility for Soviet broad gauge and Chinese standard gauge passenger cars. The yard contains standard, broad, and dual-gauge tracks.

10. The Zabaykal'sk railroad transloading yard has an estimated operating capacity of approximately 3,700 rail cars and normally accommodates fewer than 700 cars. Both Chinese standard gauge and Soviet broad gauge cars are found in the yard. Freight moving through this yard may be transloaded from broad gauge rail cars to standard gauge rail cars or it may be moved to the Man-chou-li railroad transloading yard where a similar operation occurs. Passenger car wheel sets are changed at Zabaykal'sk rather than at Man-chou-li on the Chinese side.

*Sui-fen-ho*

11. The Sui-fen-ho railroad transloading yard is approximately 3 miles west of the Sino-Soviet border in northeastern China. This facility consists of two transloading and holding yards; a storage and transfer yard; a small holding and receiving yard; a large dead-end repair yard and shop; a bulk storage area; a possible petroleum storage area; several warehouses; and a turntable. The transloading yard functions as a transfer point from Soviet broad gauge to Chinese standard gauge tracks. The yard contains standard, broad, and possibly dual-gauge tracks.

12. The Sui-fen-ho transloading yard has an estimated operating capacity of approximately 600 railroad cars and normally accommodates fewer than 125 cars. Freight traffic moving between the Soviet Union and China must be transloaded from broad gauge rail cars to standard gauge rail cars at this facility or at the counterpart facility across the border in the USSR at Pogranichnyy. Both Chinese standard gauge and Soviet broad gauge cars are found in this transloading yard.

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*Pogranichnyy*

13. The Pogranichnyy railroad transloading complex consists of two transloading yards, Pogranichnyy I, approximately 12 miles from the Sino-Soviet border in the USSR on the broad gauge rail line from Ussuriysk, and Pogranichnyy II, approximately 16 miles from the border on the same rail line. Pogranichnyy I includes two transloading yards; a petroleum transfer and storage facility; a transfer siding; a repair yard; a warehouse; coal storage; and a turning wye. Pogranichnyy II includes two transloading yards; a gauge-changing facility; a petroleum transfer and storage yard; a bulk transfer yard; a transfer yard for smaller materials; and two turning wyes. This transloading complex functions as a transfer point from Soviet broad gauge to Chinese standard gauge tracks. The yards contain standard, broad, and dual-gauge tracks.

14. The Pogranichnyy transloading yards have a combined estimated operating capacity of approximately 1,600 railroad cars and normally accommodate fewer than 400 cars. Both Chinese standard gauge and Soviet broad gauge cars are found in the yards. Freight moving through these yards may be transloaded from broad gauge rail cars to standard gauge rail cars or it may be moved to the Sui-fen-ho yard in the PRC, where a similar operation occurs.

*Erh-lien-hao-t'e*

15. The Erh-lien-hao-t'e railroad transloading yard is near the China - Mongolia border in northern China on the rail line traversing Mongolia and connecting with the Trans-Siberian railroad at Ulan-Ude in the USSR. This facility consists of a 21-track holding yard; a railroad car truck changing facility; a freight car transloading facility; four freight transloading areas; a locomotive repair facility; a coaling facility; a possible diesel and/or car repair facility; a turning loop and turning wye; and numerous storage buildings. There are no facilities for the transloading of petroleum products at Erh-lien-hao-t'e. The transloading yard functions as a transfer point from Soviet broad gauge to Chinese standard gauge tracks and as a gauge-changing facility for broad gauge and standard gauge passenger cars. The yard contains standard, broad, and dual-gauge tracks.

16. The Erh-lien-hao-t'e transloading yard has an estimated operating capacity of approximately 700 rail cars and during the past three years normally accommodated fewer than 150 cars. Both Chinese standard gauge and Soviet broad gauge cars are found in the yard. Freight moving through this facility must be transloaded from broad gauge rail cars to standard gauge rail cars.

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*P'ing-hsiang*

17. The P'ing-hsiang railroad transloading and transshipment yard is approximately 7 miles from the China - North Vietnam border in southeastern China. This facility includes a central transloading yard; a dual-gauge holding yard with passenger station; a meter gauge holding yard; a dual-gauge rail-to-road transfer area; a standard-to-meter gauge transfer area; a dual-gauge spur serving an area with three warehouses and petroleum handling facilities; two possible small repair facilities; and two turning wyes. The transloading yard functions as a transfer point from Chinese standard gauge to North Vietnamese meter gauge (3 feet 3-3/8 inches) tracks. The

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18. The P'ing-hsiang transloading yard has an estimated operating capacity of approximately 1,200 rail cars and for the past 2-1/2 years, prior to June 1972, has normally accommodated 300 to 400 cars. Both Chinese standard gauge and North Vietnamese meter gauge rolling stock are found in the yard. Not all traffic is transloaded at P'ing-hsiang, however, as Chinese standard gauge rail cars may move from this yard as far south as the yard at Gia Lam, 3 miles east of Hanoi, on the dual-gauge tracks completed in 1967. Related facilities within a 6-mile radius of the transloading yard are the P'ing-hsiang petroleum products storage facility; the P'ing-hsiang ammunition depot; and several vehicle storage areas.

*Dong Dang*

19. The Dong Dang railroad transloading and transshipment yard is approximately 3 miles south of the China - North Vietnam border in northeastern North Vietnam and approximately 10 miles from the P'ing-hsiang transloading yard. This facility includes a five-track holding yard; five associated spurs; a turning wye in an engine servicing area; and a turning circle with three dead-end tracks inside the circle. The transloading yard has an estimated operating capacity of approximately 300 rail cars and normally accommodates 100 or fewer cars. Nine vehicle storage areas are within four miles of the yard. This rail yard is on the dual-gauge rail line from P'ing-hsiang to Gia Lam.

*Ho-k'ou*

20. The Ho-k'ou railroad yard [REDACTED] is on 25X1D3a the meter gauge rail line from K'un-ming just north of the China - North

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Vietnam border in southern China and within a mile of the two-track Lao Cai holding yard. The Ho-k'ou facility contains two dead-end rail sidings which are used for rail-to-road freight transshipping and can accommodate about 20 rail cars. Normally, five or six cars are found in the railroad yard.

*Liu-tiao-pan*

21. The Liu-tiao-pan railroad yard [REDACTED] is on the meter gauge rail line approximately 3 miles northeast of Ho-k'ou in southern China. This facility, a holding yard, consists of six holding tracks; one through main line track; a possible station; a storage building; and a support building. A shop area consists of one service track; a turning wye; three shop buildings; and one building under construction. Coal storage is available on either side of the service track. This railroad yard has an estimated operating capacity of approximately 160 rail cars.

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*Lao Cai*

22. The Lao Cai railroad facility [REDACTED] is on the K'un-ming-to-Hanoi meter gauge rail line near the China - North Vietnam border in northwestern North Vietnam. The facility includes two distinct railroad yards. A holding yard approximately 400 feet from the China - North Vietnam border consists of two holding tracks and contains no other facilities. An additional yard approximately 2 miles from the border includes a seven-track holding yard; a locomotive servicing area with three tracks; a servicing shed; a turntable; and a turning wye. The Lao Cai facility has an estimated operating capacity of approximately 250 rail cars and normally accommodates fewer than 80 cars.

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Chinese Railroad System

*General Description*

23. At the end of 1971 the Chinese rail network consisted of more than 25,000 miles of mostly standard gauge line. Northeastern China has about one-third of the network, whereas the south and southwest combined have slightly less than 20%. As a result of the construction program of the 1950s, all provinces and regions except Tibet are connected to the railroad network by at least one main rail line. China has 11 international rail connections - five with North Korea, two each with the USSR and North Vietnam, and one each with Mongolia and Hong Kong.

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24. China is now beginning to experience the revolution in railroad motive power completed in Western countries more than ten years ago. The rail system is still primarily steam-powered. However, diesel locomotives have been introduced at an increasing rate since 1965 and may now account for as much as 10% to 15% of the locomotive inventory. The total number of locomotives operating on the system is estimated to be about 6,000 units.

25. The Chinese freight car fleet is relatively new. About one-third of the cars have been produced since 1965. At the end of 1971 the fleet amounted to at least 185,000 cars, including about 100,000 gondolas, 38,000 tank cars, 38,000 boxcars, and some 9,000 miscellaneous cars (flatcars, refrigerator cars, stock cars, and the like). The tank car component of the fleet increased substantially during the 1960s, keeping pace with the rapid expansion of petroleum output.

26. The volume of rail freight traffic in China may have amounted to about 560 million tons in 1970 and approximately 620 million tons in 1971 (about 1.7 million tons per day). More than 40,000 cars were loaded each day during 1971. The railroad system carried the volume of goods offered to it in 1970-71 without appreciable strain. Transport of petroleum by rail has increased substantially in recent years and may have amounted to about 35 million tons in 1971 (96,000 tons per day). Peking has claimed continued substantial gains in industrial output in early 1972, and still no evidence has come to light of appreciable delays or bottlenecks in transportation.

#### *Ability to Handle Diverted Traffic*

27. If former sea shipments to North Vietnam were diverted to overland movement by railroad, the major share of the traffic would probably enter China through the transloading point at Man-chou-li - Zabaykal'sk. International rail shipments through Erh-lien-hao-t'e have fallen off in recent years and Sui-fen-ho has never been used as a point of entry for North Vietnam shipments. The rail distance from Man-chou-li to P'ing-hsiang via Wu-han is approximately 3,100 miles; from Sui-fen-ho, 2,900 miles; and from Erh-lien-hao-t'e, 2,300 miles. Traffic moving through the border crossing point at Ho-k'ou - Lao Cai would have to move nearly an additional 800 miles if it branched off the main north-south line at Liu-chou. Shipments routed directly to Ho-k'ou via Pao-chi, Ch'ung-ch'ing, and K'un-ming would have a somewhat shorter distance to travel.

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28. Shipments entering China through Man-chou-li would go east on the single track line to Ha-erh-pin and then south on the main north-south double track line through Peking, Cheng-chou, and Wu-han. About 50 miles south of Wu-han the line becomes single track again and remains single track to the terminus at P'ing-hsiang. At this point the line connects with the main dual-gauge line to the vicinity of Hanoi via Dong Dang. In Yunnan Province the lines converging on K'un-ming are standard gauge, single track. From K'un-ming a meter gauge single track line extends through the border stations at Ho-k'ou and Lao Cai to Hanoi. On the main north-south route, transloading or transshipment of cargoes takes place at P'ing-hsiang or Dong Dang, although some trains could continue to Gia Lam, 3 miles east of Hanoi, on the dual-gauge tracks, with only appropriate border checks at P'ing-hsiang or Dong Dang.<sup>(4)</sup> In Yunnan Province, transloading of cargoes must take place at K'un-ming for further shipment on the meter gauge line to North Vietnam.

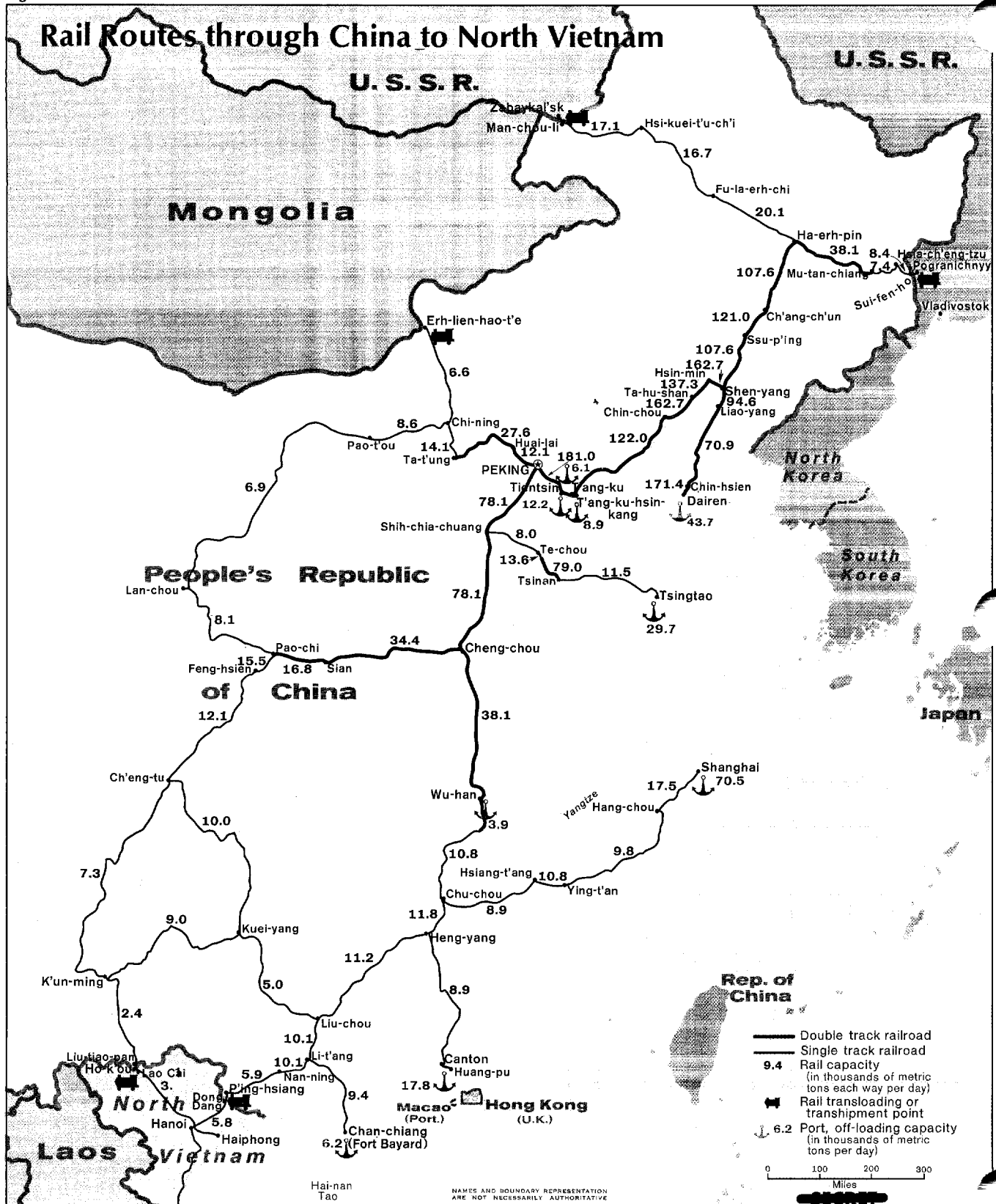
29. The *military* traffic capacities of key Chinese rail lines leading from the ports and transloading points is presented in Figure 6 in thousand metric tons each way per day (EWPd). Most of the capacities shown probably could be increased by as much as 30% for strictly *economic* traffic. The capacity of the main north-south line varies from a high of 181,000 tons EWPd between Peking and Tientsin to 5,900 tons EWPd between Nan-ning and P'ing-hsiang. Thus the last 140 miles of the line leading to the North Vietnamese border is the limiting section of the line. All sections north of this one on the main line have higher capacities, as do the lines leading from the major ports. The meter gauge line leading to the border at Ho-k'ou has a capacity of 2,400 tons EWPd. In total, the two lines leading to the border have a capacity for *military* traffic of 8,300 metric tons EWPd.

30. These capacities are conservative estimates based on a wide variety of factors, including the extent and condition of facilities, the availability of equipment, and the employment of a normal labor force. Improvisation can enable theoretical rail system capacities to be exceeded for considerable periods of time when demand is great and when the government assigns high priority to moving the goods. Furthermore, the permanent capacities can be expanded by simple expedients such as the construction of passing tracks at more frequent intervals.

4. Hanoi has a Transportation Coordinating Committee stationed at P'ing-hsiang to accept and expedite shipments moving from China to North Vietnam.

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Figure 6



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31. Precise information is not available on the degree to which these individual routes are being used. In view of the precipitous decline in the volume of Sino-Soviet trade during the 1960s, the continuing improvement of the Chinese rail system, the alternative routes available within China, and the greater use which might be made of the border crossing at Erh-lien-hao-t'e, the Chinese almost certainly would not have any serious problems in terms of line capacity in handling an additional 6,000 metric tons of transit traffic per day.

*The Special Case of Petroleum*

32. If Hanoi decides to divert all previous seaborne imports to overland shipment across China, about 1,000 tons of this would be petroleum. The entire requirement for petroleum could be met from China's own production and transportation resources. Under these circumstances, petroleum could come from any number of Chinese refineries, including major refineries at Shanghai, Lan-chou, Ta-ch'ing, or Peking. In the event that the USSR continued to be the major supplier, petroleum would enter China through the rail transloading point at Man-chou-li on the China-USSR border. There are no facilities for the transloading of petroleum products at Erh-lien-hao-t'e on the China-Mongolia border.

33. If the Chinese railroad authorities instituted a shuttle system, a given number of tank cars and locomotives would be assigned to this movement of petroleum and would not engage in any other operation. Such a shuttle system would operate from the Chinese refineries or the border transloading points to Hanoi via P'ing-hsiang. The extreme case would require that all 1,000 tons per day move from the border crossing point at Man-chou-li to P'ing-hsiang, a distance of about 3,100 miles, or 6,200 miles per round trip. For such a movement of petroleum, about 500 tank cars in regular operation would be required.<sup>(5)</sup> This number of cars represents little more than 1% of the estimated 38,000 tank cars in China's inventory. No more than 30 locomotives would be needed, or one-half of 1% of the 6,000 locomotives in China's inventory. The burden on China's rail system would be even smaller if these shipments were to originate entirely or in part at the Chinese refineries. The rail line capacity from the border crossing point or the Chinese refineries, as indicated in Figure 6, is more than adequate to handle this traffic in addition to the traffic currently moving over these routes.

5. At 350 miles per day, about 18 days' travel time would be required. One day for loading and one day for unloading at each end of the haul would result in a turnaround time of 20 days. At an average load of 40 tons per tank car, about 500 tank cars would be required.

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34. Recently the North Vietnamese requested that the USSR deliver about 55,000 tons of petroleum during June 1972. The movement of 55,000 tons of petroleum by rail from the USSR to North Vietnam during one month would require about 900 Chinese tank cars in constant operation, or some 2% of the estimated Chinese tank car inventory. This requirement is based on the assumption that the petroleum would enter China through the rail transloading point at Man-chou-li.

35. If all remaining 1971 North Vietnamese seaborne imports of food, fertilizer, machinery, and equipment (about 5,000 tons per day) were to come from north and northeast China, about 2,000 freight cars would be required in constant operation.<sup>(6)</sup> This number of cars represents little more than 1% of the total Chinese freight car inventory. As in the case with petroleum, the cost of moving these goods by rail would be higher than moving them by sea. Nonetheless, the physical capacity of the overland routes to handle the added burden is unquestionably available.

#### Ports

##### *Southern Area*

36. If Chinese ports and related rail lines are used to move supplies to the border of North Vietnam, the Chinese would probably prefer that ports nearest North Vietnam be used for two reasons: (1) to keep the economic costs of transporting the supplies to a minimum, and (2) to keep the disruption of normal Chinese transport operations to a minimum. All of the approximately 5,000 tons of dry cargo that came by sea on an average day in 1971 could theoretically be handled by the nearest major Chinese port complex at Chan-chiang. The two nearest major Chinese ports -- Chan-chiang and Canton - Huang-pu -- have a combined dry cargo offloading capacity more than four times that of Haiphong. As can be seen from the tabulation below, Canton - Huang-pu by itself has about three times the capacity necessary to handle all the dry cargo formerly handled by Haiphong and Ben Thuy/Vinh. Huang-pu, now the major port for foreign and coastal trade in South China, is capable of berthing ten vessels.

6. Again, an extreme case because imported foodstuffs would not have to come from north or northeast China. The factors used in deriving the 2,000-car requirement follow:

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<u>Port</u>	<u>Number of Berths</u>	<u>Minimum Estimated Dry Cargo Capacity (Tons per Day)</u>
North Vietnam		
Haiphong	13	5,500
Ben Thuy/Vinh	0	600
China		
Chan-chiang	6	6,400
Canton - Huang-pu	10	17,800

37. The port at Chan-chiang has storage facilities for 75,000 tons of petroleum and Canton - Huang-pu for slightly more than 50,000 tons. The storage facilities at Chan-chiang, however, would not be suitable for the type of petroleum products shipped to North Vietnam without extensive cleaning of the storage tanks. The facilities at Canton are in constant use for domestic distribution of petroleum products in South China. The use of this storage capacity on a regular basis for shipments destined for North Vietnam would necessitate a considerable adjustment in the distribution arrangements in South China.

38. The Chan-chiang port complex has good rail and road connections to the North Vietnamese border areas. It is about 250 miles nearer North Vietnam than Canton and is about 600 miles closer by rail. Even so, supplies unloaded at Chan-chiang would have to move about 350 miles by rail to reach the North Vietnamese border. The port itself, which has undergone major expansion in recent years, is reportedly the best equipped port in the area south of Shanghai. Six ships can be berthed at the port.

39. Sufficient rail capacity is available to clear both the ports of Chan-chiang and Canton - Huang-pu of supplies bound for North Vietnam and move them daily to the railhead at P'ing-hsiang. The following example shows how the logistical problem of moving petroleum to North Vietnam would be greatly eased if Soviet or other foreign tankers could unload petroleum for North Vietnam at the port of Chan-chiang. The round trip distance between Chan-chiang and P'ing-hsiang would be only about 700

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miles and the turnaround time would be four days. About 100 tank cars would be able to carry the daily requirement of 1,000 tons. From Canton to P'ing-hsiang (a round-trip distance of 1,940 miles), about 200 tank cars would be required.

#### *Other Areas*

40. The Chinese might prefer to use ports other than those nearest North Vietnam in order (1) to meet special conditions (for example, to avoid disturbing previously scheduled shipments or receipts of goods) or (2) to spread the increased load over several ports. Use of these more distant ports would be more costly because of the greater distance the freight would need to be carried over water and land. China's largest port -- and the one next closest to Canton -- Shanghai, for example, is about 1,400 miles from the railhead of P'ing-hsiang, or 1,050 miles farther than the port of Chan-chiang (see Table 1).

Table 1  
 Estimated Capacities of Selected Chinese Ports  
 and Rail Distances to P'ing-hsiang

Name <sup>a/</sup>	Capacities (Metric Tons)		Number of Berths for Ships and Tankers	Approximate Rail Distance to P'ing-hsiang (Miles)
	Daily Dry Cargo Offloading	Petroleum Storage		
Chan-chiang	6,400	75,000	6	350
Canton-Huang-pu	17,800	51,000	10	970
Shanghai	70,500	616,000	86 ships and 5 tankers	1,400
Tsingtao	29,700	36,000	14 ships	1,960
Tientsin	27,200	101,000	14 ships	1,820
T'ang-ku- hsin-kang	8,900	Limited	14 ships	
Ta-ku/T'ang-ku	6,100	89,000	0	
Tientsin	12,200	12,000	0	
Dairen	43,700	171,000	50 ships and 5 tankers	2,500

a. Ports are listed from south to north.

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41. In addition to the large ports shown in Table 1, there are about ten coastal and inland ports that could be used to offload supplies for North Vietnam. All of these have capacities of less than 5,000 metric tons a day for dry cargo and thus would be able to take only a part of Hanoi's daily requirement.

#### Roads

42. A fairly extensive road network exists in the areas of southern China contiguous to the North Vietnamese border, as indicated on Figure 7. The network traverses flat terrain in the eastern coastal regions, hilly terrain in the central portion of the China - North Vietnam border area, and mountainous terrain farther west. During the rainy season, many segments of the network, particularly in the low-lying coastal region, become inundated, earth roads become masses of mud, and lightly surfaced roads are dangerously slick. Landslides and washouts occur in the mountainous areas. Typhoons are common along the coast in July, August, and September and cause considerable damage.

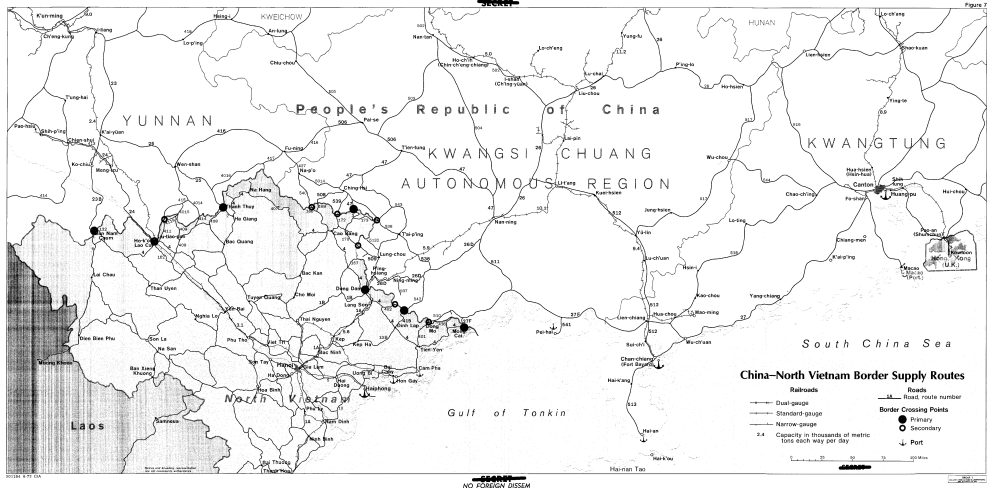
43. Direct through routes, moreover, are scarce in this area as in the rest of China because roads have been developed on the provincial and local levels. The Chinese have made an extensive effort to construct, maintain, and improve roads in the border area, and, as a result, the roads in this area are in better condition than those in the interior and in the northern regions.

#### *Road Connections at the Border*

44. A total of 15 to 20 road connections traverse the China - North Vietnam border (see Figure 7). These connections vary widely in capacity: most of them are surfaced with gravel, are in fair-to-good condition, and cross hilly to mountainous terrain. They have an estimated dry season capacity of about 10,000 tons a day; during the wet season (June-September) their estimated combined capacities drop to about 3,000 tons a day.

45. As in the case of the rail line capacities, these road capacities are conservative estimates based on a wide variety of factors, including the extent and conditions of facilities, the availability of equipment, and the employment of a normal labor force. The capacities of the roads could be increased by improved grading or the more intensive use of manpower to repair road segments washed out during the rainy season.

46. Several of the roads that cross the China - North Vietnam border parallel or connect with the two rail lines that enter North Vietnam.



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Route 26-D parallels the Peking - P'ing-hsiang rail line and Route 24 parallels the K'un-ming - Ho-k'ou line. In addition, Routes 47, 509, and 538 connect with the P'ing-hsiang rail line, and Routes 23 and 25 connect with the Ho-k'ou line. These roads could provide alternate routes for cargoes backlogged on the rail lines leading into North Vietnam. A series of roads run parallel to the North Vietnamese border between the two rail lines (Routes 47, 506, 416, and 25); numerous roads run from these routes to the border.

*Road Connections Away from the Border*

47. Roads farther north of the border are less important in the network of supply routes from China to North Vietnam. The movement of supplies by truck from the port of Huang-pu, for example, would require a trip of approximately 500 miles along coastal Route 27 to the nearest North Vietnamese road at Mong Cai. In any case, good railroad connections to North Vietnam are available at Huang-pu. More likely, roads would be used for the movement of supplies from the ports of Hai-an and Pei-hai, where no rail lines exist, and from the port of Chan-chiang as a supplement to the railroad.

48. The port of Pei-hai is accessible for the movement of supplies to North Vietnam only by road since no railroad exists in the immediate area. Supplies could reach the P'ing-hsiang rail line at Nan-ning by means of Routes 541, 27, 511, and 26, a distance of approximately 150 miles. This route could accommodate approximately 900 tons a day during the dry season. An alternate route to North Vietnam, entirely by road, would include Routes 541 and 27 from Pei-hai to Mong Cai, a distance of approximately 110 miles. This alternate route can accommodate approximately 1,200 tons a day during the dry season.

49. The port of Chan-chiang is on a rail line that connects with the P'ing-hsiang rail line at Li-t'ang. Routes 512 and 27, however, could supplement the railroad in moving supplies from the port to the North Vietnam border at Mong Cai, a distance of approximately 210 miles. This route can accommodate approximately 1,300 tons a day during the dry season. Route 512 parallels the Chan-chiang - Li-t'ang rail line but would probably not be used.

50. The port of Hai-an, approximately 90 miles south of Chan-chiang on Route 513, is accessible for the movement of supplies to North Vietnam either by the railroad at Chan-chiang or by Routes 512 and 27 to Mong Cai. Route 513 from Hai-an to Chan-chiang can accommodate approximately 1,100 tons a day during the dry season. This tonnage could be moved by road to the North Vietnamese border at Mong Cai if no other

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cargo were moving along Routes 512 and 27. If additional supplies from Pei-hai or Chan-chiang were moving on these routes, the tonnage moved by road to the border from Hai-an would be reduced or diverted to the railroad at Chan-chiang.

#### *Truck Inventory*

51. China's truck inventory consists of about 500,000 vehicles of widely varying types and capacities. In general, the inventory is well maintained and used efficiently. Although the number of trucks available in southern China is unknown, the Chinese could readily provide an adequate number of trucks to move supplies by road to North Vietnam. If sizable numbers of trucks were required for a large-scale supply operation, dislocations and backlogs of highway traffic undoubtedly would occur in other areas. Under most circumstances, the disruptions would be short-lived and would have little effect on the economy.

#### Overland Traffic

##### Across the Northern Border

52. Most of the rail traffic from the Soviet Union and East European countries to North Vietnam crosses the northern Chinese border at Man-chou-li - Zabaykal'sk. This route also carries a major share of Soviet and East European traffic moving to and from China. Although total traffic crossing the border has been greatly reduced since the late 1950s, the original facilities still exist for transloading a large volume of goods between Soviet broad gauge and Chinese standard gauge cars. In 1956 a total of about 6.4 million tons (17,600 tons per day) of goods crossed the border, of which about 2.8 million tons (7,600 tons per day) moved through the transloading yard at Man-chou-li - Zabaykal'sk. The direction of this traffic and the volume moving through the other two border crossing points in 1956 are shown in the following tabulation (tons per day):

	<u>Imports to China</u>	<u>Exports from China</u>	<u>Total</u>
Man-chou-li - Zabaykal'sk	2,700	4,900	7,600
Sui-fen-ho - Pogranichnyy	1,200	2,200	3,400
Erh-lien-hao-t'e	2,900	3,700	6,600
Total	6,800	10,800	17,600

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In 1956 approximately 60% of Chinese imports consisted of petroleum (about 4,100 tons per day). Most of the remainder was industrial materials and equipment. Exports included a wide variety of agricultural and animal products, chemicals, minerals, and textiles.

53. During the peak years of Sino-Soviet trade in the late 1950s, congestion at the transloading yards occasionally disrupted the even flow of traffic. The USSR complained that freight cars were being delayed for unduly long periods because the Chinese railroads were not always able to accept the traffic owing to a shortage of freight cars, particularly tank cars. There is no evidence, however, that the disruptions were due to a lack of transloading facilities at the transloading yards.

54. During the 1960s the reduction of trade between the Soviet Union and China resulted in a sharply lowered volume of rail traffic crossing the border. The pattern of traffic also changed, with by far the greatest share crossing the border at Man-chou-li and a much smaller share moving through Erh-lien-hao-t'e. The Chinese apparently wanted to avoid use of the Trans-Mongolian route through Erh-lien-hao-t'e in order to keep from paying freight revenues to the Mongolians who had come within the Soviet sphere of influence by the mid-1960s.

55. Little information is available on the volume of traffic crossing the northern border in the 1960s.

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56. The rolling stock counts at Erh-lien-hao-t'e apparently substantiate other evidence of the decline in international rail traffic through Mongolia.

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Across the Southern Border

57. At the southern end, the major rail route for goods moving from China to North Vietnam is the Chinese standard gauge line from Li-t'ang through Nan-ning to the transloading yards at P'ing-hsiang, about 7 miles from the North Vietnamese border. In 1964, traffic on the Nan-ning - P'ing-hsiang line consisted of eight freight trains and one passenger train each way per day, according to one observer. [REDACTED]

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[REDACTED] on the rail line between P'ing-hsiang and Hanoi during 1964 and early 1965 have provided the most recent rail traffic count for the North Vietnamese line. The following tabulation presents the data as reported:

<u>Month and Year</u>	<u>Reported Average Number of Freight Trains Moving EWPD Through Dong Dang</u>	<u>Estimated Average Number of Cars per Train</u>	<u>Estimated Average Number of Cars Mov- ing EWPD</u>
1964			
Jan-Feb	4-8	20	80-160
Mar-Sep	3	20	60
Dec	4	20-25	80-100
1965			
Jan	6-8	25	150-200

58. A large portion of this traffic consisted of coal, petroleum products, lumber, steel plate, and machinery, some of which was Chinese transit traffic moving between Yunnan Province and the remainder of China, before the opening of the Kuei-yang - K'un-ming rail line in 1966. The

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59. Until late 1967, when the major North Vietnamese line northeast of Hanoi was converted to accommodate both meter and standard gauge trains, all rail traffic between China and North Vietnam was transloaded at P'ing-hsiang between Chinese standard gauge and North Vietnamese meter gauge cars. Estimates of the actual volume of traffic moving between China and North Vietnam were far from exact even before the rail line was converted, and they have been much less reliable since that time.

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60. Traffic apparently increased in March 1965

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61. Since these observations were made, no hard data on which to base an estimate of the total volume of rail shipments moving into North Vietnam have become available. There are, however, open press and private statements in the so-called Sino-Soviet debate which indicated the amount of Soviet deliveries to North Vietnam. The first was a public statement by the Chinese in May 1966 revealing that China had delivered some 43,000 tons of Soviet military aid supplies to Vietnam during the last 11 months of 1965 (about 130 tons per day) and 556 freight car loads during the first quarter of 1966 (6.2 carloads per day). Again, in early 1967, the Chinese Foreign Minister made a public statement that during 1966 the USSR had given North Vietnam only 40,000 tons of materials (110 tons per day). Throughout the debate, although the two sides referred to "military supplies," the discussion may have included economic goods as well.

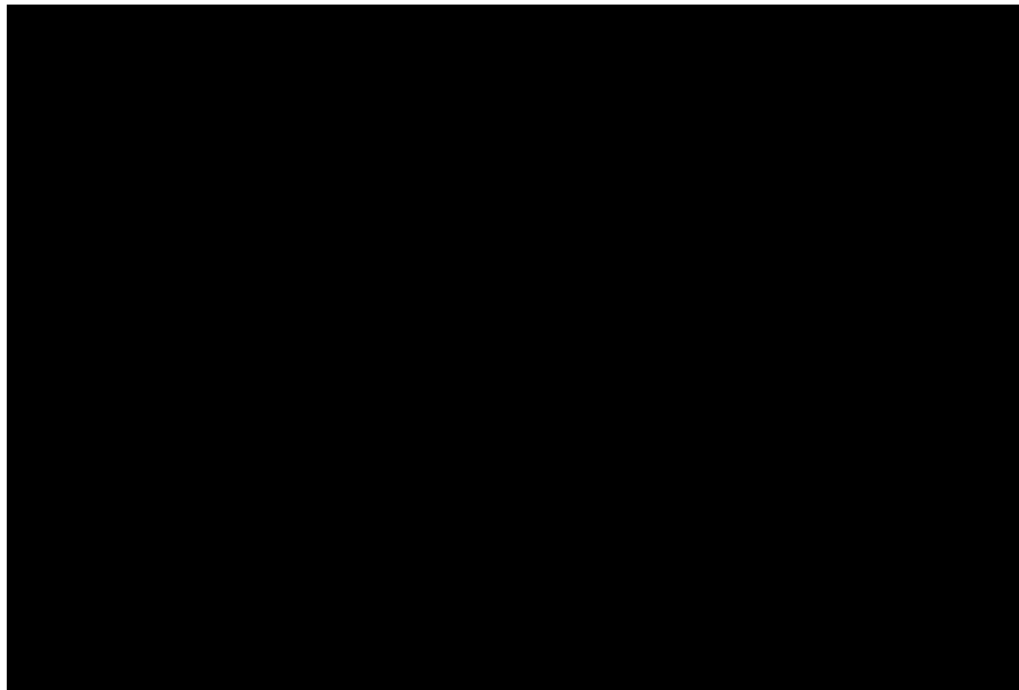
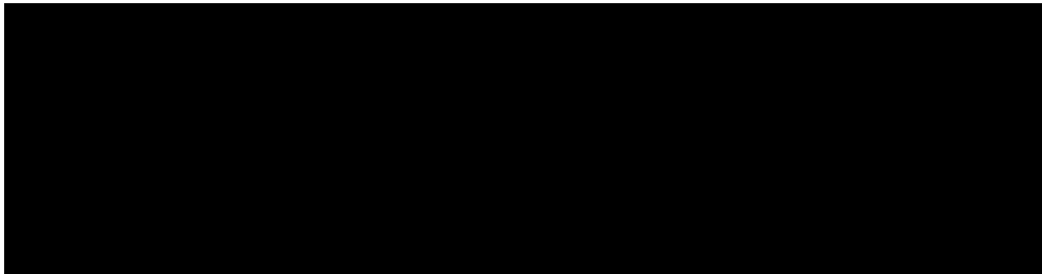
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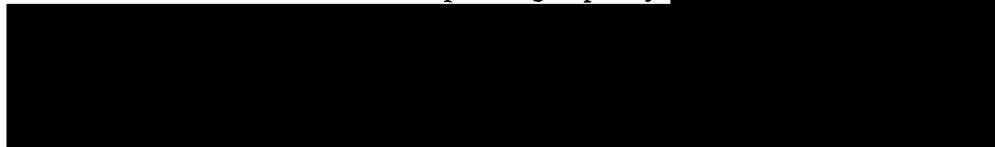
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65. On the Hanoi - K'un-ming line, the border crossing point of Ho-k'ou - Liu-tiao-pan on the Chinese side recorded a high of 110 cars and locomotives on 23 July 1968, when the two yards were operating at about three-fifths of estimated operating capacity.



#### COMINT Evidence of Overland Shipments

66. COMINT reveals that Soviet and East European military-related economic goods (such as trucks, electronic equipment, and small amounts of petroleum) have moved regularly by rail to North Vietnam. The data are generally too fragmentary, however, to be used in arriving at an overall estimate of the volume of rail traffic moving to North Vietnam.

7. Another source has indicated that since 1968 the PRC has limited Soviet shipments through its territory to 10,000 tons per month.

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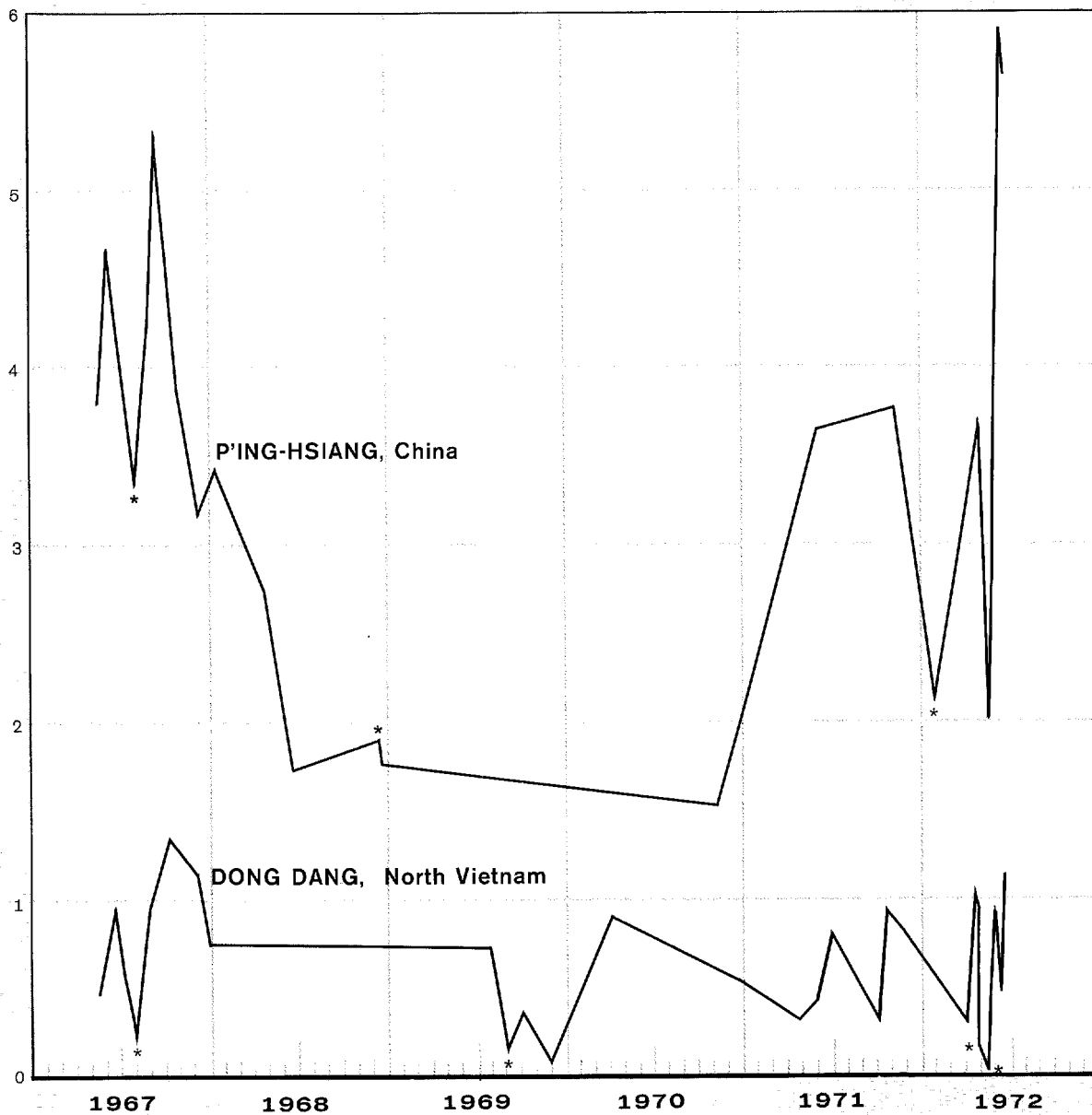
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Figure 8

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RAILROAD EQUIPMENT  
(Hundreds)



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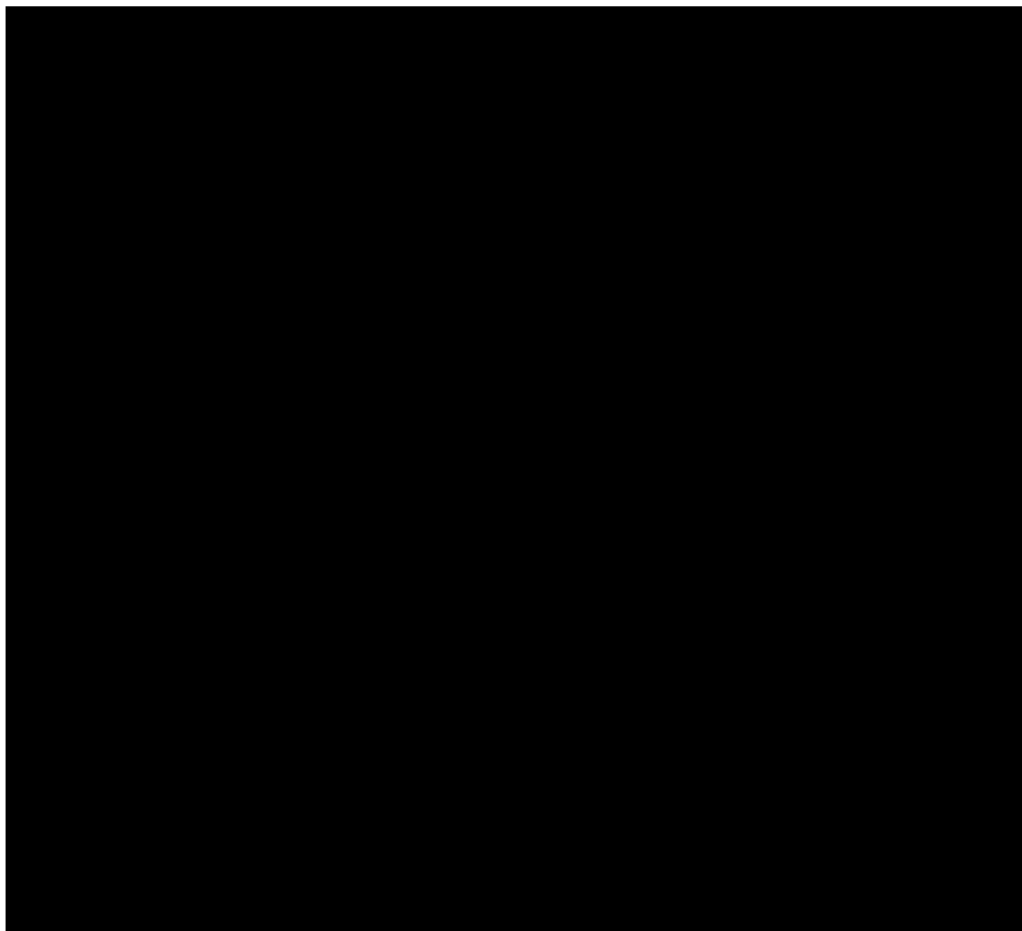
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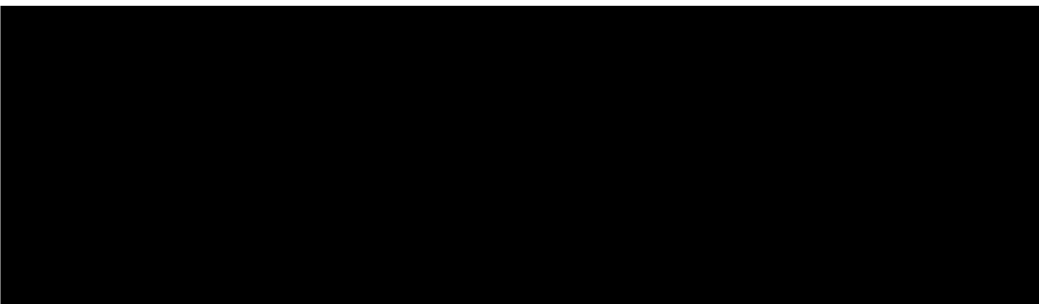
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North Vietnam's Transportation Links with China

73. North Vietnam's transport system from China embraces two railroads, 15 to 20 road connections, and the Red River (see Figure 7). The total uninterdicted capacity of the transport system is about 20,000 metric tons a day during the dry season (October-May) and some 13,000

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metric tons a day in the wet season (June-September). Capacity for these routes is estimated as follows (in metric tons per day)<sup>(8)</sup>:

Hanoi - Dong Dang Railroad	5,800
Hanoi - Lao Cai Railroad	3,100
Seven primary roads <sup>a</sup>	7,200/2,350
Seven secondary roads	3,600/1,000
Red River	250/1,000
<b>Total</b>	<b>19,950/13,250</b>

a. Defined as roads having estimated capacities of about 900 tons a day in the dry season.

Compared with the seaborne imports in 1971 of 6,000 tons per day, it is apparent that in a bomb-free environment, the North Vietnamese have an overland resupply capability far in excess of requirements.

#### Railroads

74. The rail network in North Vietnam accounts for most of the long-haul freight traffic carried by the transport system and is the primary means used to move overland imports. North Vietnam's main access to China and the primary route used for rail imports is the Hanoi - Dong Dang line, which runs from the border 117 miles to Hanoi. This line is dual-gauge from the border to Gia Lam, three miles east of the capital. It has an uninterdicted capacity of 5,800 tons a day and, because it is dual-gauged, it can draw on the large Chinese inventory of standard gauge rolling stock. The line has 25 major bridges - the largest being the 5,614-foot Doumer Railroad/Highway Bridge over the Red River at Hanoi. In the border area, it goes through high, rugged terrain where past limitations have been largely corrected since the 1965-68 US bombing campaign by realigning the track and correcting the grades.<sup>(9)</sup> A major realignment (dual-gauge) 15 miles

8. These capacities are derived from research completed in 1968. To the extent they do not reflect subsequent improvement and expansion of the system, they must be considered as minimum estimates. Moreover, there are other roads crossing the border which could be used to move supplies. These capacity estimates do not, of course, take into account the effects of the current bombing program. Therefore, they represent "uninterdicted" capacity.

9. The 1965-68 bombing campaign left the overland links along North Vietnam's northern border largely untouched, as targets were restricted inside a border buffer zone.

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south of the Chinese border contains six tunnels – one 3,500 feet long – and eight bridges, one of which has 11 spans to carry rail traffic 1,500 feet across a river. South of Kep the Thai Nguyen line to the west gives the North Vietnamese alternate routing to Gia Lam.

75. The Hanoi - Lao Cai line runs 180 miles into Yunnan Province, China. This meter gauge line has an estimated capacity of 3,100 tons per day. Before 1965 the line was used largely to move Chinese goods between Yunnan Province and southeastern China. After K'un-ming was connected with the rest of the Chinese rail network in mid-1966, this line became less important for Chinese transit traffic. The line traverses less rugged terrain than the Dong Dang line. Nonetheless, it has more than 140 bridges – only a few exceeding 100 feet in length – but no tunnels. Its most striking engineering feature is the five-span, 1,050-foot Viet Tri bridge across the Lo (Clear) River a mile north of its confluence with the Red River.

76. The North Vietnamese inventory of railroad transportation equipment just prior to the current bombing effort was the largest in its history. The inventory stood at about 2,500 freight cars and 150 locomotives in 1969 – a slight increase over 1965. Imports have probably increased the inventory since 1969 and permitted the North Vietnamese to retire some older units. During 1971, China provided some 240 rail cars to North Vietnam. Since 1968 the USSR has provided at least 31 new diesel locomotives. An additional 27 units are scheduled to be delivered in 1972; currently, an agreement for another 12 units is being negotiated.<sup>(10)</sup> These new locomotives probably have permitted the North Vietnamese to scrap some older steam engines, particularly the smaller ones. The larger steam engines have continued to power most of the traffic on the rail system. The newer diesels are used chiefly on the rail line south of Thanh Hoa where the roadbed and bridges are probably inadequate for the heavier steam engines. The inventory is bolstered by the fact that Chinese standard gauge cars can operate on the Hanoi - Dong Dang line and the alternate line via Thai Nguyen. Also, North Vietnam's inventory of meter gauge cars can be supplemented by borrowing from China's inventory in Yunnan Province.

10. Probably the first new locomotives to be received by North Vietnam since before World War II arrived in early 1968. The Soviet-built TU-5E diesel locomotives were specifically manufactured for North Vietnam. The TU-5E is a low-power diesel estimated to have about half the axle load of North Vietnamese steam locomotives. The typical steam engine in North Vietnam weighs fully loaded about 100 metric tons; the TU-5E weighs 25 metric tons.

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### Roads

77. There are seven primary roads entering North Vietnam from China. These roads are surfaced with crushed rock, are generally well drained, and have a dry season capacity of 7,200 tons per day. The key roads and closest entry routes are those along the northeastern border: Routes 4, 415, and 1B. Route 4 along the coast could become an important link should Communist ships offload cargoes at Chan-chiang or Huang-pu and use roads to supplement overland rail movement into North Vietnam. There are also seven secondary roads - all but one in the northeast - crossing the Chinese border into North Vietnam which boost available road capacity by an additional 3,600 tons per day during the dry season. Several other roads of less importance also exist. The major limitation on the primary and secondary roads is weather: during the wet summer months, June-September, their aggregate capacity drops to 3,350 tons per day. In the border area the roads run over high rugged terrain, where considerable bridging and sharp curves are necessary. This complicates the construction of alternates and bypasses. As the roads descend into the Red River Delta, the more amenable terrain permits a multiplicity of routes, alternates, and bypasses.

78. North Vietnam had an estimated inventory of 18,000 to 23,000 trucks prior to the current bombing program - the largest inventory in its history. [REDACTED]

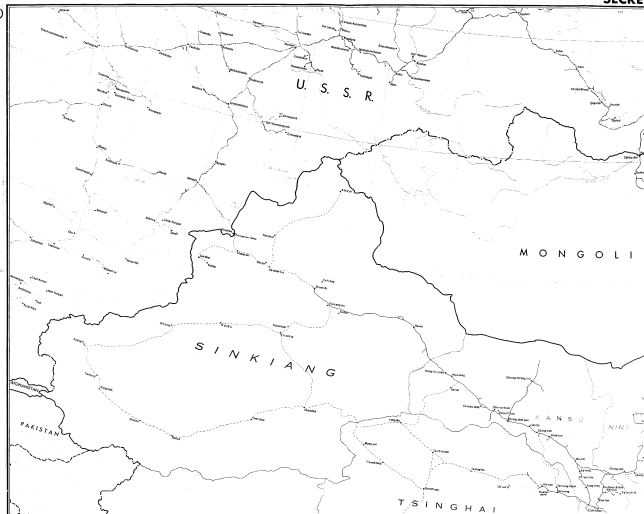
[REDACTED] The USSR has agreed to deliver 5,600 trucks to North Vietnam in 1972, and about 40% of these have already arrived.

### The Red River

79. The Red River meanders 200 miles southeastward from Yunnan Province to Hanoi. Its cargo capacity is estimated to be 1,000 tons per day during periods of high water (June-September) and 250 tons per day during the dry season. The vulnerability of watercraft on the river to air attack discourages large-scale use of this route. Nonetheless, it could be used as an alternate to the railroad and roads in this area.

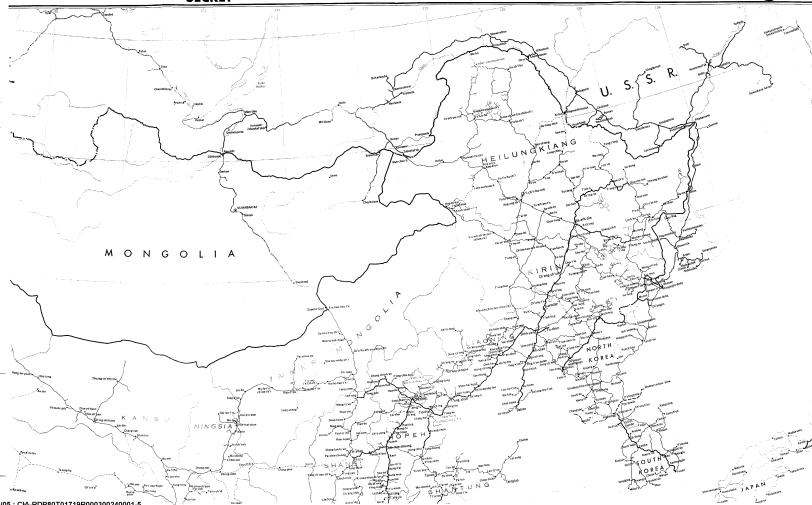
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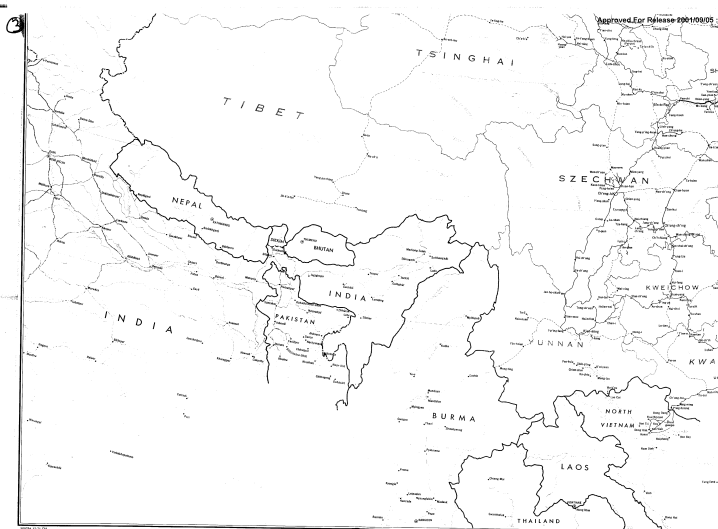
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